

# CONSUMERS' WINE PREFERENCES IN A CHANGING SCENARIO: A GENERALIZED MULTINOMIAL LOGIT APPROACH

**Cristina Escobar, Zein Kallas y José M. Gil\***

*CREDA – UPC – IRTA: Centro de Investigación en Economía y Desarrollo Agroalimentario. Castelldefels (Barcelona).*

The international economic crisis has had a severe impact on the Spanish economy. Alongside, political changes have also occurred in Catalonia the recent years. Data from two identical Discrete Choice Experiments performed in two different times (2008 and 2010) show how these changes did affect consumers' wine preferences. The Generalized Multinomial Logit model (GMNL) has been applied as it allows determining consumers' degree of certainty and heterogeneity in the choice making. The results showed that the scale and the taste heterogeneities have decreased significantly after the economic crisis, which may imply that external common circumstances had a homogenising influence in consumer choices by decreasing the level of randomness of consumers' selection. The consumers' preferences for a Catalan origin of the wine also increased.

## 1. Introduction and Objectives

Wine consumption in Catalonia, as a traditional wine country, experiences a shift in the later years: the demand for higher-quality wines increases while consumption of table wines decreases (MAGRAMA, Consumption panel, 2014). However, the Catalan wine sector show a relatively low market share of the Catalan quality wines (DO): Catalan DO wines only account up to 33.7% of the total quality wine consumption in Catalonia (Nielsen Panel, 2014). On the other hand, Catalan quality wines are every time more consumed and appreciated beyond our borders (DATACOMEX, 2014).

Since 2007 the world economy has undergone a phase of marked instability. The economic crisis in Spain has had an adjustment in employment that can be defined as virulent and protracted. It began in early 2008 (Ortega, E. and Peñalosa, J., 2012) with a peak of unemployment in 2011 that reached more than 6.2 million people (INE, 2014). Consequently, there is been a sharp drop in consumption and in fixed capital investment (Carballo-Cruz F., 2011). The agro food sector has also faced the consequences of the crisis (Nielsen Market trends, follow up 2008-14).

Political changes have also occurred in Catalonia in the recent years. The amount of nationalist Members of Parliament (MP) increased 10.1% from 2006 to 2010. Later on, those "strongly in favour of an independent Catalonia" MP increased in the elections of 2012 in 7.4% (data from the Catalan Parliament, in comparison with the elections of 2010). Besides, the main nationalist party in Catalonia (CIU, for *Convergència i Unió*), has shifted from nationalism to Catalan independentism (Guibernau, M., 2013; Hopkin, J., 2012; Serrano, I., 2014; amongst others).

In this context, our main goal is to determine consumers' wine preferences in Catalonia and their changes regarding the newer economic and political scenario.

## 2. Methodology

Discrete Choice Experiments (DCE) aim to identify the individual's indirect utility function associated with attributes of products by examining the trade-offs they make when making choice decisions. Our data has been modelled by the recently developed model, the Generalised Multinomial Logit (GMNL) of Fiebig et al. (2010). The GMNL allows the determination of preference (or taste) and scale heterogeneity simultaneously. In this case, the expression of the utility to person  $n$  from choosing alternative  $j$  on choice set  $t$  is given by:

$$U_{njt} = (\beta_{0j} + \eta_{0nj}) + [\sigma_n \beta + \gamma \eta_n + (1 - \gamma) \sigma_n \eta_n] X_{njt} + \varepsilon_{njt} \quad (1)$$

where  $\gamma$  is a mixing parameter between 0 and 1; which value stands as the level of dependency between the scale heterogeneity  $\sigma_n$ , and the heterogeneity of the random parameters  $\eta_n$ ; and  $\sigma_n$  is the individuals' (n) scaling of  $\beta$  up or down, and where  $(\beta_{0j} + \eta_{0nj})$  are the heterogeneous intercepts, with  $\beta_0$  being the mean vector, and  $\eta_{0n}$  the stochastic component.

The first step of DCE is to define the main attributes that consumers consider in wine choice, for which we examined prior research performed on wine choice (Kallas et al., 2013; Bernabéu et al., 2012; amongst others). The final set of attributes included was: origin, grape variety, wine references and price.

Data were collected from two identical surveys performed in two different times: before (early 2008) and during (end 2010) the current economic crisis (400 and 401 consumers, respectively).

### 3. Results and Discussion

Both models are statistically significant and exhibited a good fit with highly significant likelihood ratios. For both surveys, consumers' preferences are higher for the local (Catalan) origin of the product, and for the grape variety Cabernet sauvignon. In 2008, the results show that practically all random parameters are significant. However, some of these become not significant in 2010, as Spanish wines and the No-choice option. The latter's utility turns from negative to positive, with a remarkable high value in 2010. Thus, consumers show a greater preference for not taking the product, indicating persistence in the unobserved attributes (Table 1).

The scaling factor ( $\tau$ ) has turned to be not significant in 2010 from a significant positive value in 2008. As the parameter  $\tau$  decreases, the degree of scale heterogeneity decreases as well. Therefore, the variation of the degree of randomness in consumers' decisions has decreased significantly and, thus has the degree of uncertainty in the decision-making process. The mixing parameter gamma ( $\gamma$ ) also becomes not significant in 2010, which confirms that the taste heterogeneity is proportional to the scale heterogeneity.

The results for taste heterogeneity in 2008 are significant for all the identified parameters, with the exception of the level "recommended". Conversely, in 2010, taste heterogeneity is equal to zero for most of the parameters. This goes in accordance with the values obtained for the scaling factor ( $\tau$ ) and the mixing parameter gamma ( $\gamma$ ).

### 4. Conclusions

This work is, to our knowledge, the first application in the literature of food and wine preferences studies to measure the impact of the economic and political crisis in Catalonia (Spain). Two identical surveys were carried out before and during the economic crisis. These allow us to assess how the changing scenario affected consumers' wine preferences. The Generalized Multinomial Logit model (GMNL) decomposes unobserved heterogeneity into taste heterogeneity and scale heterogeneity. Thus, it can determine consumers' degree of certainty and heterogeneity in the choice making.

Consumers' preferences are higher for the local (Catalan) origin of the product and for the grape variety Cabernet Sauvignon. Nevertheless, in 2010, wine preferences are more homogeneous across consumers: results do not show unobservable heterogeneity, neither scale nor taste heterogeneity. In this sense, the external common circumstances may have had a homogenising influence in consumer choices. Furthermore, it is worth noting that consumers' utility for Spanish wines becomes non-significant in 2010. These findings are in accordance with the economic and political scenario.

**Table 1.** Random parameter estimates and specifications of the GMXL model. Results for 2008 and 2010.

	2008	2010
Log-Likelihood (0)	-3955.00	-3964.89
LL ratio test	947.73 (0.000)	3650.00 (.000)
Pseudo R2	.1198152	.4602901
AIC/N	1.965	1.217
<i>Random Parameter Estimates</i>		
<b>Spanish</b>	<b>2.03293***</b>	<b>.27705</b>
<b>Catalan</b>	<b>3.80717***</b>	<b>.73884***</b>
<b>Recommended</b>	<b>-.80762**</b>	<b>-.20509***</b>
<b>Prestigious</b>	<b>-1.06844***</b>	<b>.09827</b>
<b>Grenache</b>	<b>-1.52072***</b>	<b>-.25125</b>
<b>Cabernet sauvignon</b>	<b>1.58843***</b>	<b>.29349**</b>
<b>Price-10€</b>	<b>.90290**</b>	<b>.01346</b>
<b>Price-14€</b>	<b>-1.96268***</b>	<b>-1.19805***</b>
<b>No choice</b>	<b>-2.52462***</b>	<b>2.86293***</b>
<b>Variance parameter tau in scale parameter (<math>\tau</math>)</b>	<b>2.05073***</b>	<b>.05930</b>
<b>Weighting parameter Gamma (<math>\gamma</math>)</b>	<b>.02924*</b>	<b>.10052</b>
<b>Standard deviations of parameter distributions</b>	Sd-Spanish	<b>3.12735***</b>
	Sd-Catalan	<b>5.09622***</b>
	Sd-Recommended	<b>.23246</b>
	Sd-Prestigious	<b>1.65080***</b>
	Sd-Grenache	<b>1.81875***</b>
	Sd-Cabernet sauvignon	<b>2.74603***</b>
	Sd-Price-10€	<b>3.05442***</b>
	Sd-Price-14€	<b>4.86483***</b>
	Sd-No choice	<b>7.34722***</b>

Significance levels:\*\*\* p&lt;0.01; \*\*p&lt;0.05; \* p&lt; 0.10

## References

- Bernabéu, R., Díaz, M., Olivas, R. and Olmeda, M. (2012). "Consumer preferences for wine applying best-worst scaling: a Spanish case study". *British Food Journal*, 114(9), 1228-1250.
- Carballo – Cruz, F. (2011). "Causes and Consequences of the Spanish Economic Crisis: Why is the recovery taking so long?". *Panoeconomicus*, 3, 309-328.
- Catalan Parliament (2014).
- DATA COMEX (2014). Foreign trade statistics. Spanish Ministry of Economy and Competitiveness.
- Fiebig, D. G., Keane, M. P., Louviere, J., and Wasi, N. (2010). "The generalized multinomial logit model: accounting for scale and coefficient heterogeneity". *Marketing Science*, 29(3), 393-421.
- Guibernau, M. (2014). "Prospects for an independent Catalonia". *International Journal of Politics, Culture, and Society*, 27 (1), 5-23.
- Hopkins, J. (2012). "Catalonia's election result reflects the fragmented and divided nature of the pro-independence majority". London School of Economics experts' blog.
- INE (2014). Spanish Statistic Institute. Employment data.
- Kallas, Z.; Escobar, C., and Gil, J.M. (2013). "Analysis of consumers' preferences for a special-occasion red wine: A dual response choice experiment approach". *Food Quality and Preference*, 30 (1), 156–168.
- MAGRAMA (2014). Spanish Agriculture, Food and Environment Ministry. Household consumption data.
- Nielsen Market trend (2014).
- Nielsen (2014) from INCAVI (Wine and Vine Catalan Institute). The market of wines with designation of origin.
- Ortega E. and Peñalosa J. (2012). The Spanish economic crisis: key factors and growth challenges in the Euro area. Banco de España. Documentos ocasionales, núm. 1201.
- Serrano I. (2014). The evolution of the political discourse in Catalonia 2003-2014: From Self-government to Self-determination. Open university of Catalonia.